

Original Article

Complex study for an epistemology of Exercise and sport sciences: a) key concepts of both ERC subpanels and CUN keywords; b) Physical training and sport methodology sciences academic disciplines in pedagogy recruitment sector and biomedical one: a relationships study

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Abstract

The epistemology of Exercise and sport sciences is debating themselves in Italy because it is too young to have a historical and solid scientific tradition. Physical training sciences academic discipline and Sport sciences one have bilocated in pedagogy scientific sector and biomedicine one such as established of Italian National University Council (CUN). Which means, physical training sciences academic discipline and Sport sciences one be divided in two different recruitment sectors. It propose itself the present study, made by two different ones. ERC grants economic contributions for scientific projects through participation in competitive tenders divided into defined recruitment sectors in Italian university body. Actually, in Italy the academic disciplines of Physical training sciences and Sport are bilocated in two scientific area: Pedagogy and Medicine. This is a problem because it is a misunderstanding between recruitment sectors and academic disciplines, so become cause of error to select the right recruitment sector of Exercise and sports sciences field researchers in the selection of the recruitment sectors when they participate at ERCEA tenders. To aim the solution by archive research method with documentary approach. It have to search the relationship throughout the deductive and interpretative process. Results carried out CUN keywords and ERC subpanels are the basis that build the solution for the significative reciprocal aspects. Finally, physical training of sports sciences and human movement and sport education CUN keywords become key concepts if they are in relationship to epistemology SH4_1 Cognitive basis of human development and education, SH4_5 Attention, perception, action, consciousness and LS4_1 Organ physiology subpanels.

The second part is an experimental study. After 40 years the Higher Institutes of Physical Education ISEF, which were established with the aim of being placed within the university system, were transformed into degree programs to guarantee continuity at the 22 territorial ISEF at that time. To allow this transformation, two new academic disciplines were set up with the M-EDF code and the scientific contents were systematized within the classification of academic knowledge. With the law 240 of 2010 the recruitment sectors were established with the main purpose of enabling and recruiting university professors, establishing the minimum levels of scientificity with procedures defined strictly by law. The academic disciplines were systematized in the recruitment sectors and two academic of exercise and sport sciences disciplines were distributed in 9 recruitment sectors allocated in three scientific areas CUN 5 biological sciences, 6 medical sciences and 11 historical, philosophical, psychological and pedagogical sciences. Consequently, the professors have structure, after two restatements, inscientific biomedical area and in scientific pedagogical one. To aim exactly the data processes on recruitment sectors and academic disciplines after the restatement.

Keywords: Physical training sciences, Sport sciences, Academic disciplines, Recruitment sectors, CUN keywords, ERC sub-panel, Key concepts.

Introduction of first part

Actually, the scientific identity of Exercise and sport sciences is discussing in Italy because it is in body academic early and does not have scientific tradition. Physical training sciences academic discipline and Sport sciences have two interfaces: pedagogy and medicine; the Consiglio Universitario Nazionale CUN is debating in which scientific area have to be located. Which means, physical training sciences academic discipline and Sport sciences one are in two recruitment sectors: Pedagogical and medical one.

In other hand, European Research Council (ERC) scheme, basic document of European Research Council Executive Agency (ERCEA) of European Union (EU), is made by three macro areas: Social Sciences and Humanities (SH) where is the pedagogy, Physical Sciences and Engineering (PE) and Life Sciences (LS) with panels and subpanels for the definition of the knowledge fields LS Life Sciences and the 25 panels and 333 subpanels as annex 1 of ERC panels peer review evaluation panels ERC panels.

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(https://erc.europa.eu/sites/default/files/document/file/ERC_Panel_structure, 2019).

The ERCEA encourages the highest quality research through competitive funding among researchers and supports investigator-driven frontier research across all fields, on the basis of scientific excellence. In this way, ERC grants economic contributions for scientific projects through participation in competitive tenders divided into defined recruitment sectors in Italian university bodies. Actually, the hierarchical levels of university bodies are three: 1) academic discipline, recruitment sectors and group of recruitment sectors (attachment D DM 355, 2015), and they are structured in each of the 14 scientific areas of CUN (law 18, 2006). In Italy, the academic disciplines of Physical training sciences and Sport one have a bilocation in Pedagogy area and Medicine one, and it is a unique case. Currently in Italy, Exercise and sport science has been placed in Pedagogical sector and medical one, because both academic disciplines of Physical training sciences and Sport sciences are in SH and LS (D'Isanto, 2019, 2016, Raiola et al., 2018). In the first application of the bilocation in two scientific areas, the two academic disciplines were identified in Teaching and methods of physical activities and Teaching and methods of sport activities because they are placed in scientific area CUN 11 Historical, philosophical, psychological and pedagogical sciences and so, they are in recruitment sector of pedagogy (D'Elia, 2019, D'Elia et al., 2018). In the same way, the two academic disciplines are considered in recruitment sector of medicine as identified in Physical training sciences and Sport science and methodology because they are placed in scientific area CUN 6 Medical sciences. Currently despite, the academic disciplines are called in both areas in the same manner: Physical training sciences and Sport sciences and methodology. Ultimately, the distinction of the first denomination of two academic disciplines, which was different according to the recruitment sectors because in two different scientific areas, it is now the same. The adopted denomination is the original one of the scientific area 6 Medical sciences in contradiction to the allocation of the disciplinary sectors in the scientific area 11. Probably, this paradox of contradiction hides the real intention of the university minister to allocate the two academic disciplines of exercise and sports sciences in the medical area in contempt of the allocation, which was determined by law, in the historical, philosophical, psychological, and pedagogical scientific area. The particularly confusion is the great problem to assess the ERCEA project because it is necessary to identify exactly the area to compete for funding at tenders. In this case, it should be selected if the project is in social sciences and humanities or in life sciences. To aim the solution is the way to run.

Method of first part

Archive research throughout documentary lines and deductive an interpretative investigation to carry out the data. To search the key concepts is the way to follow and compare the CUN keywords and ERC subpanels so it defines itself the related key concepts including the link between Italian academic system and ERC scheme.

Results of first part

The result of the selection of the CUN keywords referring to exercise and sports sciences in the list of 2400 are reported in table n.1.

Table 1. Four CUN keywords of exercise and sport sciences

35	Allenamento	Physical training
109	Apprendimento	Learning
501	Didattica delle attività motorie e sportive	Human movement and sport education
1933	Scienze dell'esercizio e dello sport	Physical training and sport sciences

The result of the selection of the ERC subpanels referring to exercise and sports sciences in the list of 333 are reported in table n.2.

Table 2. Nine ERC subpanels structure of exercise and sport sciences

Area	Panel	Subpanel
Social sciences and humanities	SH3 The Social World, Diversity, Population	SH3_9 Health ... SH3_11 ..., curriculum studies, educational policies
	SH4 The Human Mind and Its Complexity	SH4_1 Cognitive basis of human development and education... SH4_5 Attention, perception, action, consciousness SH4_6 Learning...
Life sciences	LS1 Molecular Biology, Biochemistry, Structural Biology and Molecular Biophysics metabolism	LS1_2 Biochemistry and metabolism
	LS4 Physiology, Pathophysiology and Endocrinology	LS4_1 Organ physiology, ... LS4_5 Metabolism,

Discussion

Results show that the CUN keywords and ERC subpanels could be the basis of the solution for the similarity of the some reciprocal meaningful. Particularly, some CUN keywords, such as physical training of sports sciences and human movement and sport education (table 1.) are in subpanels definition, such as SH4_1 Cognitive basis of human development and education, SH4_5 Attention, perception, action, consciousness and LS4_1 Organ physiology (table 2).

The process of arrangement/reorganization of scientific knowledge have to play grasping the meaningful of the keyconcepts instead of the keyword to make a synthesis in order to obtain the reciprocal relationship. To grasp in the sign of a single declaration of the exercise and sport sciences, can be proceed throughout two approaches:

- a) Declining the contents of “knowledge” and also the methods of research, if different than the research traditions of the scientific area
- b) Following the document evolution by specifying the type of sources: 1) Synthesis of the declaratory of academic disciplines of Exercise and sport sciences.

The table n.3 take in key concepts the relation between ERC scheme and CUN keywords.

Table 3. Keyconcepts and project application

CUN Keywords	ERC Subpanels	Keyconcepts	Projects application	ERC Area and Panels
35 Physical training	LS1_2 Biochemistry and metabolism	Biochemistry and metabolism for physical training	Health and Wellness	LS – LS1
109 learning	SH4_6 Learning,	Motor learning	Motor development learning	SH - SH4
501 human movement and sport education	SH4_1 Cognitive basis of human development and education, SH4_5	Attention, perception, action and consciousness for Movement and sport education	Physical and sports education	SH - SH4
1933 physical training and sport sciences	LS4_1 Organ physiology, LS4_5 Metabolism	Organ physiology and metabolism for training and sport performance	Sport Performance and training	LS – LS4

The submitted project that have the keyconcepts as following.

- Health and Wellness
- Motor development learning
- Physical and sports education
- Sport Performance and training

Thus, the correlation among four 2016 CUN keywords and eight ERC sub-panels 2019 could have the whole meaningful and to open a new way to give a solution at the question.

Introduction of second part

After 40 years the Higher Institutes of Physical Education ISEF were transformed into degree programs to continue for the 22 ISEF locations. For this reason, two new academic disciplines were instituted with the M-EDF code with scientific delaration. the recruitment sectors were established by law n. 240 of 2010 to recruit the university professors. The academic disciplines were systematized in 9 recruitment sectors allocated in three scientific areas CUN 5 biological sciences, 6 medical sciences and 11 historical, philosophical, psychological and pedagogical sciences. After the second restatements, 7 recruitment sector were eliminated and only two academic disciplines remain in area medical n. 6 and the pedagogica one n. 11. It was not analyzed never the data of this redetermination and did not carry out the exact dimension of single Academic recruitment of Exercise and sport sciences academic disciplines. It is useful to know the reason of this first determination and to affirm the historical data to help the understanding the errors for this knowledge field. The aim is to trace the quantitative dimension of the process and to analyze the evolutions of the recruitment sectors and the academic disciplines during the restatement of recruitment a sectors and academic disciplines. The declination of the contents the knowledge field are different. The aim is to analyze the number of professor of Exercise and sport sciences program distinguished in Physical activity sciences and in Sport Sciences and what was the reciprocity of trend in that period and what are the main characteristics of the evolution.

Method of second part

It is firstly archive research by documentary approach, second the survey of data by CINECA platform of MIUR and then correlation analysis by SPS...

Results of second part

The Gelmini reform law n. 240, 30th December 2010, instituted the recruitment sector as recipients where the academic disciplines are inside as scientific affinity contents to examine the candidate professors. These recruitment sectors are restatement twice to adapted them at the changes. For this reason in table n. 1 compare the inactive and disactive wordings. As following, the table n. 4 shows the data.

Year	11D2	06N2	06N1	06D2	06B1	05H1	05F1	05E1	05D1	05L1
	E D F 1 2	E D F 1 2	E D F 1 2	E D F 1 2	E D F 1 2	E D F 1 2	E D F 1 2	E D F 1 2	E D F 1 2	E D F 1 2
2011	9 3	Inactive*	0 7	7 1	5 0	0 3	0 0	1 3	0 1	4 6 8 3
2012	17 7	Inactive*	1 1 9 3	2 0	7 0	2 20	0 0	11 0	1 3 1 3	Disactive*
2013	15 9	Inactive*	1 1 7 3	2 1	6 0	3 19	0 0	9 1	1 3 4 4	Disactive*
2014	16 9	Inactive*	1 1 5 3	4 1	7 0	3 18	0 0	11 1	1 2 2 8	Disactive*
2015	1 1 0 2	5 6 2 0	3 3	1 0	1 0	2 3	0 0	5 1	2 2	Disactive*
2016	12 9	6 7 5 7	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*
2017	1 1 0 2	6 7 6 2	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*
2018	1 1 5 2	6 7 7 0	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*
2019	1 1 9 1	6 7 9 2	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*	Disactive*

11D2		r = coefficient correlation
9	3	
17	7	
15	9	
16	9	
10	12	
12	9	
10	12	
15	12	
19	10	

r = 0, 10544

Low positive correlation between the EDF 1 and EDF 2 SSDs in the competition sector 11D2.

When one of the two variables varies, the other varies very slightly; that is, there is a very low association between the two variables (of 11D2).

06N2		r = coefficient correlation
52	60	$r = 0,83401$ High positive correlation between the EDF 1 and EDF 2 SSDs in the 06N2 competition sector. With the variation of one variable (increase) there is a corresponding variation (increase) also for the other variable, ie there is a strong association between the two variables (of 06N2).
65	77	
66	72	
67	70	
69	72	

Table 4. Distribution of M-EDF professor do academic disciplines inside of ten recruitment sector istitutedanet across three restatement

06N1		r = coefficient correlation
0	7	$r = 0,89411$ High positive correlation between the EDF 1 and EDF 2 SSDs in the 06N1 competition sector. With the variation of one variable (increase) there is a corresponding variation (increase) also for the other variable, ie there is a strong association between the two variables (of 06N1).
19	13	
17	13	
15	13	
3	3	

06D2		r = coefficient correlation
7	1	$r = 0,650011$ Good positive correlation between the EDF 1 and EDF 2 SSDs in the competition sector 06D2.
2	0	
2	1	
4	1	
1	0	

06B1		r = coefficient correlation
5	0	$r = \#DIV/0!$ Absence correlation between the EDF1 and EDF2 SSDs in the 06B1 competition sector.
7	0	
6	0	
7	0	
1	0	

05H1		r = coefficient correlation
0	3	$r = 0,719725$ Good positive correlation between the EDF 1 and EDF 2 SSDs in the competition sector 05H1.
2	20	
3	19	
3	18	
2	3	

05F1		r = coefficient correlation
0	0	$r = \#DIV/0!$ Absence correlation between the EDF1 and EDF2 SSDs in the 05F1 competition sector.
0	0	
0	0	
0	0	
0	0	

05E1		r = coefficient correlation
1	3	$r = -0,86321$ High negative correlation between the EDF 1 and EDF 2 SSDs in the 05E2 competition sector. As one variable changes, the other variable decreases, as in this case (of 05E1), if it increases.
11	0	
9	1	
11	1	
5	1	

05D1		r = coefficient correlation
0	1	$r = 0,97994$ Excellent correlation between the EDF1 and EDF2 SSDs in the competition sector 05D1. With the variation of one variable (increase) there is a corresponding variation (increase) for the other variable, there is a strong association between the two variables (of 05D1).
11	33	
14	34	
12	28	
2	2	

05L1		r = coefficient correlation
48	63	$r = \#DIV/0!$ No correlation is possible between the EDF1 and EDF2 SSDs in the 05L1 competition sector

Comparison and correlation of the various SCs, including both values of the two SSDs (EDF1 EDF2)			
(from 2011 to 2015)	11D2	06N1-06D2-06B1-05H1-05F1-05E1-05D1-05L1	r = coefficient correlation
2011	12	136	$r = -0,76871$ High negative correlation between the SC 11D2 and the others, it means that as one variable increases, the other decreases.
2012	24	118	
2013	24	119	
2014	25	113	
2015	22	135	

Comparison and correlation of the various SCs, including both values of the two SSDs (EDF1 EDF2)			
(from 2016 to 2019)	11D2	06N2	r = coefficient correlation
2016	21	142	$r = -0,09901$ Absence of correlation between the SCs 11D2 and 06N2, when the coefficient r is very close to zero.
2017	22	138	
2018	27	137	
2019	30	141	

The statistical elaboration of linear regression as follow graphic no. 1-2- ... show the trend of each academic discipline for Academic filed discipline

Discussion of second part

The data that come out in the first / second determination of the SCs is a distribution with slight significance of the SC 11D2 with respect to the other SCs, particularly those of applied biology and endocrinology. Afferece to other SCs sees significance for physiology, anatomy, general medicine, biochemistry and health professions. Within the single SC the distribution of the 2 M-EDF SSDs is unbalanced

towards one of the 2 M-EDF SSDs except for the SC 11 D2 which has an estate in the first / second determination and also in the third. Said imbalance disappears in the third determination but this is due to the disappearance of the SC of the second determination and to the birth of the second SC placed in area 6 medical 06N2. The first two determinations have fragmented the afferences as it was logical that it happened, the third has, equally logically, uniformed the afferents. The number of the members of SC 06N2 is more than 4 times the SC 11D2, this proportion is maintained if we consider that the SCs of biological area 5 and medical area 6 have merged into a single SC (06N2); therefore the tightness of the SC 11D2 is unchanged during the 3 determinations. Within the 2 current SCs there is a partial imbalance of the 2 SSDs, particularly the SSD M-EDF / 01 in SC 11D2 has greater consistency, vice versa the SSD M-EDF/02 in SC 06N2.

Conclusion

The relationship between CUN keywords and ERC sub panels could be the solution way to resolve the problem of the Italian researchers when have to collegate the system of Italian university body and the ERC scheme. In conclusion, the Italia academic body have to update throughout the whole correlation among whole CUN keywords and all subpanels, because the reciprocal meanings are the concepts keys to follow up. The usefulness is to have the exact knowledge of the phenomenon in order to evaluate the possibility of arranging the M-EDF SSDs in a single SC as is the case for all 387 SSDs. The data that come out in the first / second determination of the SCs is a distribution with slight significance of the SC 11D2 with respect to the other SCs, particularly those of applied biology and endocrinology. Afference to other SCs sees significance for physiology, anatomy, general medicine, biochemistry and health professions. Within the single SC the distribution of the 2 M-EDF SSDs is unbalanced towards one of the 2 M-EDF SSDs except for the SC 11 D2 which has an estate in the first / second determination and also in the third. Said imbalance disappears in the third determination but this is due to the disappearance of the SC of the second determination and to the birth of the second SC placed in area 6 medical 06N2. The first two determinations have fragmented the afferences as it was logical that it happened, the third has, equally logically, uniformed the afferents. The number of the members of SC 06N2 is more than 4 times the SC 11D2, this proportion is maintained if we consider that the SCs of biological area 5 and medical area 6 have merged into a single SC (06N2); therefore the tightness of the SC 11D2 is unchanged during the two restatement (three determinations). Within the 2 current SCs there is a partial imbalance of the 2 SSDs, particularly the SSD M-EDF/01 in SC 11D2 has greater consistency, vice versa the SSD M-EDF / 02 in SC 06N.

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Sitography

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